III. REMARKS

Format of this Response

This response is submitted in compliance with the revised format for making amendments to the specification, claims and drawings officially adopted by the USPTO on July 30, 2003, and which is now reflected in 37 C.F.R. §1.121.

If a substitute specification is submitted herein, a clean form and marked-up version are included. Amendments to drawings, if any, are submitted in compliance with 37 C.F.R. §1.84 on replacement sheets as an attachment to this document (with an accompanying detailed explanation of all of the changes with respect to the drawings made in the remarks section of this amendment.

Status of Claims:

Claims 1-19 have been cancelled without prejudice; and claims 20-31 have been newly added. Thus, claims 20-31 are pending. No new matter has been introduced with this amendment, which is fully supported by the instant Specification.

Statement with Respect to Scope of Amended and Non-Amended Claims

Revisions to the claim set is made in order to streamline prosecution of this case in order to obtain early allowance of embodiments that are presently anticipated to be of commercial significance and in response to the Examiner's restriction requirement which has been made final in the Office Action, and are not made for a purpose of patentability. Any amendment, cancellation, withdrawal or addition made herein with respect to the claims should not be construed in any manner as indicating Applicant's surrender of any subject matter of the application, or surrender of any equivalent to any element asserted in one or more claims. Any narrowing which may be evinced with respect to subject matter covered by the claims as a whole, or by one or more claims of the appended claims whether amended, re-represented, or new, when compared to claims previously in the application, should not be interpreted as

indicating that the Applicant has generally disclaimed the territory between the original claimed subject matter and the amended claimed subject matter. Amended claims elements are to be construed to include substantial equivalents known to those of ordinary skill in the art. Applicant asserts that any amendments transacted herein are made without prejudice and reserve all rights to prosecute any canceled claims, and claim structures preceding any amendment to a particular claim, and other disclosed (but not presently claimed) embodiments in the application, in future continuation applications, divisional applications, continuation-in-part applications, continuing prosecution applications, requests for continuing examination, re-examination applications and any other application claiming priority to the present application.

Original claims of the instant US phase application have been cancelled without prejudice. Present claims 20-31 have been entered in their stead in order to conform with United States Patent practice.

CONCLUSION

The aforegoing good faith amendment is believed to place the application in condition for allowance; and an early notification thereof is respectfully requested.

Respectfully submitted,

Dated: November 22, 2005.

Hans-Peter G. Hoffmann, PhD
Reg. No. 37,352
KELLEY DRYE & WARREN LLP
TWO STAMFORD PLAZA
281 TRESSER BOULEVARD
STAMFORD, CT 06901
Phone: 203-351-8011
Fax: 203-327-2669
E-mail: hhoffmann@kelleydrye.com

of the boron grain refiner of US-A-6168071 and EP-B-0729398 significantly reduces the pitting and sagging consequent on formation and melting of the binary eutectic, the formation and melting of that eutectic is, as previously mentioned, not elimated and there is still scope for the further development of the ternary alloy to improve its pitting and sagging properties. By increasing the silver content above the level for Sterling but less than that for Britannia it is possible to produce an alloy in which the above binary eutectic either does not form or gives rise to reduced problems in subsequent heat treatment. This provides alloys with a much greater inherent stability under thermal processing. The germanium addition prevents the reduction in hardness that would be seen in a silver-copper alloy of this composition. The alloy also shows resistance to tarnishing, even under very arduous test conditions.

The invention therefore provides a ternary alloy of silver, copper and germanium containing from more than 93.5 wt% to 95.5 wt% Ag, from 0.5 to 3 wt% Ge, ~~and the remainder, apart from incidental ingredients, impurities and grain refiner, copper.~~ 1-40 ppm of B, optionally 0.5 wt % of any of Zn, Cd and Sn, optionally 0.1-1 wt % Si, and the remainder, apart from impurities copper, wherein the weight ratio of Cu to Ge is from 4:1 to 3:1.

A typical alloy that has been found to be suitable contains about 94.5 wt% Ag, about 4.3 wt% Cu and about 1.2 wt% Ge. In the above alloy the weight ratio of Cu to Ge is about 3.6:1 whereas in the existing 925 grade Argentium the ratio can be from 5.8:1 (1.1 wt% Ge) to 4.8:1 (1.3 wt% Ge). The applicants consider that it is the reduction in the Cu:Ge weight ratio that is responsible for the reduced thermal processing problems, the CuGe eutectic either not forming or forming in a significantly reduced amount during post-melt thermal processing. In particular the ratio is ~~preferably~~ from 4:1 to 3:1,

Track Changes Print – reference only

more preferably about 3.5:1. Above 4:1 the alloy is more likely to exhibit firestain, whereas below 3:1 the high germanium content gives rise to formability problems.

In the above alloy, preferred Ag contents range from about 94.0 to about 95.5 wt%, lower values being preferred for reducing the expense of the silver used. It has been found, surprisingly, that if the Ag content is increased to 96 wt% it is difficult to avoid firestain even at high Ge contents. As regards Ge, contents of from 1.0 to 2.0 wt% are preferred. Below 1.0 wt% Ge, consistent resistance to firestain and tarnish may not be obtained, whereas above 2 wt% Ge there is an increasing risk of embrittlement of the alloy. Furthermore, Ge is expensive and its expense makes it desirable to reduce its content to a minimum. The applicants have found that consistent resistance to firestain and tarnish are obtained at Ge contents of from 1.1 to 1.3 wt%. The alloy will preferably further comprise boron in an amount effective for grain refinement, typically 1-40 ppm and preferably 5-10 ppm. Excessive amounts of boron may give rise to boron hard spots, but in the case of alloys supplied for casting it will often be desirable to incorporate relatively large amounts of boron to compensate for losses on re-melting.

The alloy may contain one or more incidental ingredients known per se in the production of silver alloys in amounts that are not detrimental to the mechanical strength, tarnish resistance and other properties of the material. For example, zinc may be added e.g. in an amount of about 0.5 wt% to reduce the melting point of the alloy, to add whiteness, to act as a copper substitute, as a deoxidant and to improve the fluidity of the alloy. Cadmium may also be added in similar amounts although its use is presently not preferred. Tin may be added, typically in an amount of 0.5 wt%. Indium may be added in small quantities e.g. as a grain refiner and to improve the wettability of the alloy. Silicon may also be added in e.g. amounts of 0.1 to 1 wt%.

Track changes print - reference only

10/559092

CLAIMS

1. A ternary alloy of silver, copper and germanium containing from more than 93.5 wt% to 95.5 wt% Ag, from 0.5 to 3 wt% Ge, 1-40 ppm of B, optionally 0.5 wt % of any of Zn, Cd and Sn, optionally 0.1-1 wt % Si, and the remainder, apart fromt ~~from incidental ingredients (if any),~~ impurities ~~and grain refiner,~~ copper.

~~2. The alloy of claim 1,~~ wherein the weight ratio of Cu to Ge is from 4:1 to 3:1.

23. The alloy of claim 12, wherein the weight ratio of Cu to Ge is about 3.5:1.

34. The alloy of ~~any preceding~~ claim 1 or 2, containing from 1.0 to 1.5 wt% Ge.

45. The alloy of claim 34, containing about 94.5 wt% Ag, about 4.3 wt% Cu and about 1.2 wt% Ge.

~~6. The alloy of any preceding claim, further comprising boron in an amount effective for grain refinement.~~

~~7. The alloy of any preceding claim, containing 1-40 ppm of boron.~~

85. The alloy of any preceding claim, containing 5-20 ppm of boron.

69. A finished or semi-finished shaped article of the alloy of any preceding claim.

710. The article of claim 69, which is formed by casting.

Track changes print - reference only

811. The article of claim 69, which is at least partly produced from sheet or strip.

912. The article of claim 6, 7 or 8 surface treated with ~~Use of~~ an alkanethiol, alkyl thioglycollate, dialkyl sulfide or dialkyl disulfidee ~~for the surface treatment of an alloy according to any of claims 1-8~~.

1013. The articleuse of claim 912, wherein the alkanethiol, alkyl thioglycollate, dialkyl sulfide or dialkyl disulfide has C_{12}-C_{24} alkyl groups.

~~14. The use of claim 12 or 13, wherein the alkanethiol, alkyl thioglycollate, dialkyl sulfide or dialkyl disulfide is in an organic solvent.~~

~~15. The use of claim 14, wherein the solvent containing the alkanethiol, alkyl thioglycollate, dialkyl sulfide or dialkyl disulfide is generally neutral.~~

~~16. The use of claim 14 or 15, wherein the alkanethiol, alkyl thioglycollate, dialkyl sulfide or dialkyl disulfide is in a solvent based on n-propyl bromide.~~

~~17. The use of claim 12 or 13, wherein the alkanethiol, alkyl thioglycollate, dialkyl sulfide or dialkyl disulfide is in (a) a composition obtainable by dissolving said alkanethiol, alkyl thioglycollate, dialkyl sulfide or dialkyl disulfide in an organic solvent and adding to said solution a relatively concentrated aqueous soap or detergent, or (b) an aqueous dispersion obtainable by dissolving said alkanethiol, alkyl thioglycollate, dialkyl sulfide or dialkyl disulfide in an organic solvent, adding to said solution a relatively concentrated aqueous soap or detergent, and diluting the resulting mixture with water.~~

~~18. The use of claim 12 or 13, wherein the alkanethiol, alkyl thioglycollate, dialkyl sulfide or dialkyl disulfide is contained in a polish or impregnated into a polishing cloth.~~

Track changes print - reference only

119. The articleuse of ~~any of~~ claim 9s ~~12-18~~, wherein the alkanethiol or alkylthioglycolate is selected from stearyl mercaptan, cetyl mercaptan (octadecyl mercaptan), stearyl thioglycollate and cetyl thioglycollate.